FIG. 1

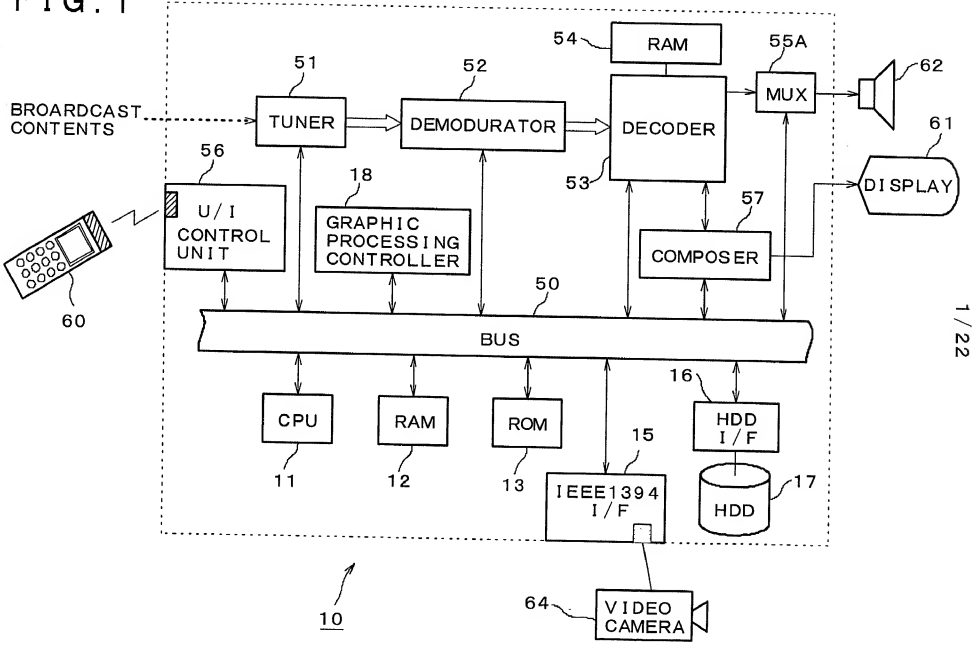

BROADCAST CONTENTS
TUNER
DEMODURATOR
DECODER
RAM
MUX
DISPLAY
U/I CONTROL UNIT
GRAPHIC PROCESSING CONTROLLER
COMPOSER
BUS
CPU
RAM
ROM
HDD I/F
IEEE1394 I/F
HDD
VIDEO CAMERA
51
52
53
54
55A
56
57
18
50
16
15
17
11
12
13
60
61
62
64
10

FIG. 2

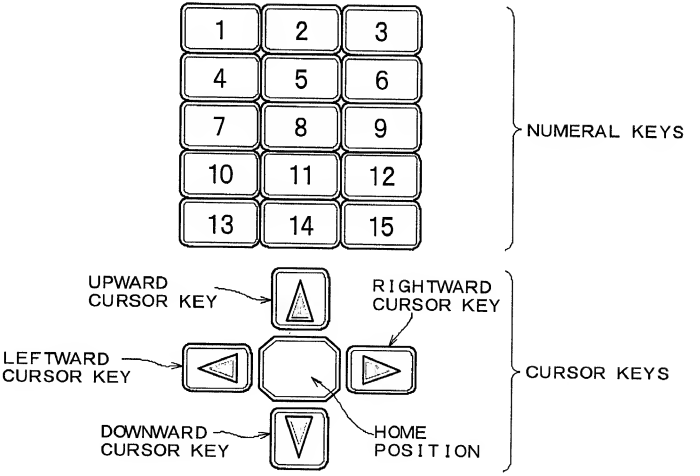

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
NUMERAL KEYS
UPWARD CURSOR KEY
RIGHTWARD CURSOR KEY
LEFTWARD CURSOR KEY
DOWNWARD CURSOR KEY
HOME POSITION
CURSOR KEYS

FIG. 3

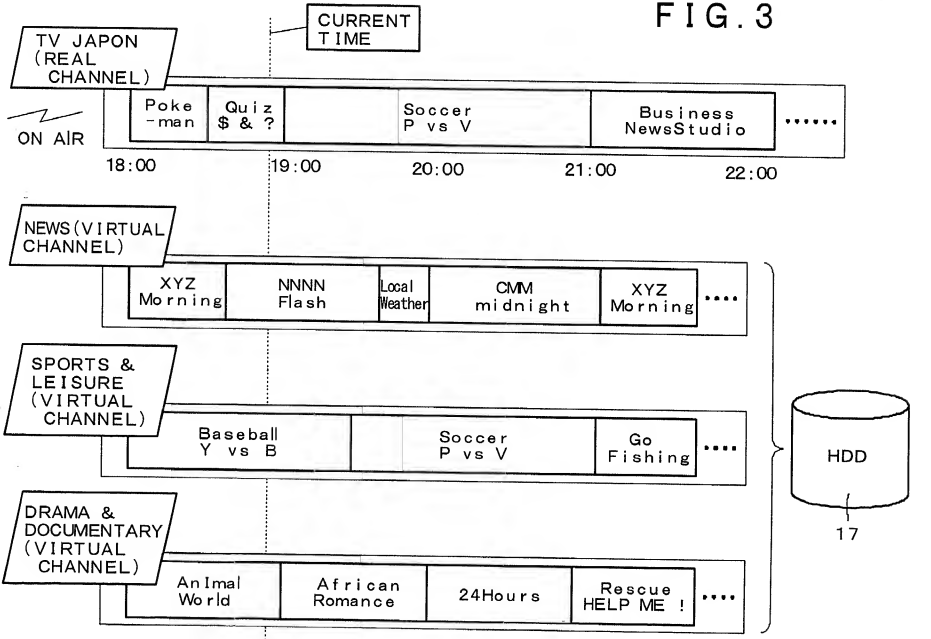

CURRENT TIME
TV JAPON (REAL CHANNEL)
ON AIR
Poke -man
Quiz $ & ?
Soccer P vs V
Business NewsStudio
.....
18:00
19:00
20:00
21:00
22:00
NEWS(VIRTUAL CHANNEL)
XYZ Morning
NNNN Flash
Local Weather
CMM midnight
XYZ Morning
....
SPORTS & LEISURE (VIRTUAL CHANNEL)
Baseball Y vs B
Soccer P vs V
Go Fishing
....
DRAMA & DOCUMENTARY (VIRTUAL CHANNEL)
AnImal World
African Romance
24Hours
Rescue HELP ME !
....
HDD
17

FIG. 4

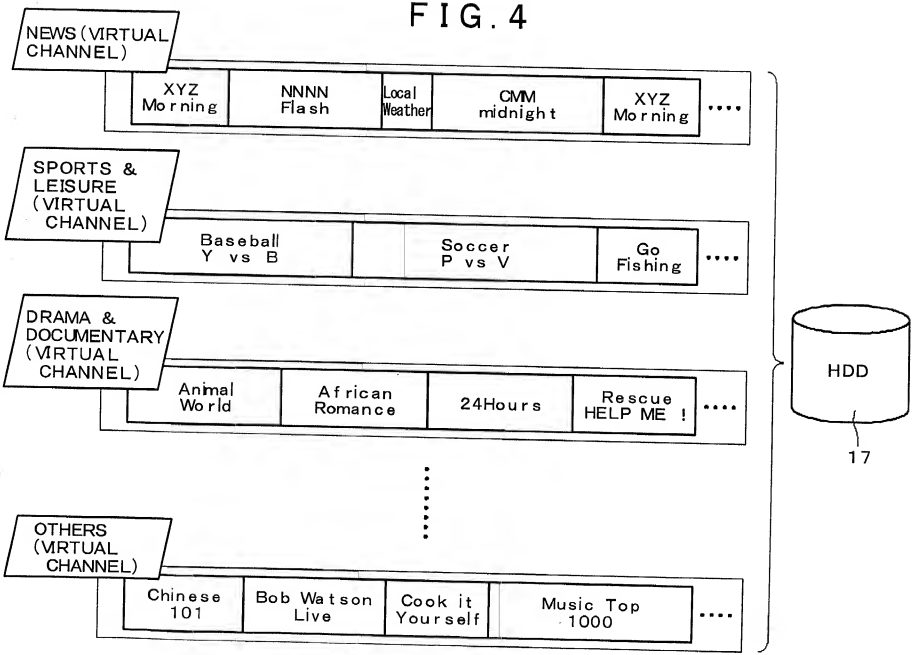

NEWS (VIRTUAL CHANNEL)
XYZ Morning
NNNN Flash
Local Weather
CMM midnight
XYZ Morning
....
SPORTS & LEISURE (VIRTUAL CHANNEL)
Baseball Y vs B
Soccer P vs V
Go Fishing
....
DRAMA & DOCUMENTARY (VIRTUAL CHANNEL)
Animal World
African Romance
24Hours
Rescue HELP ME !
....
OTHERS (VIRTUAL CHANNEL)
Chinese 101
Bob Watson Live
Cook it Yourself
Music Top 1000
....
HDD
17

FIG. 5

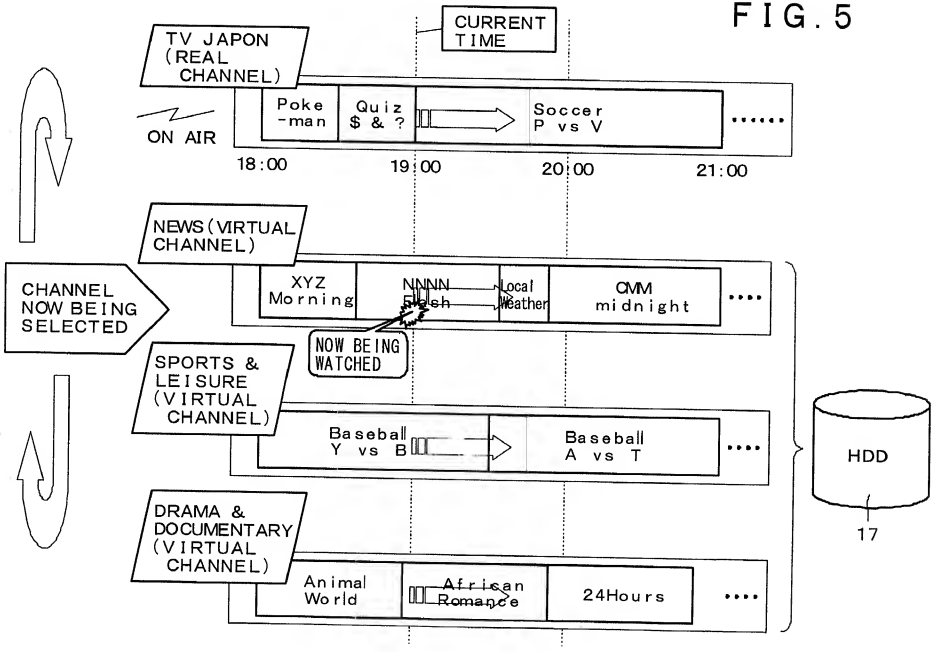
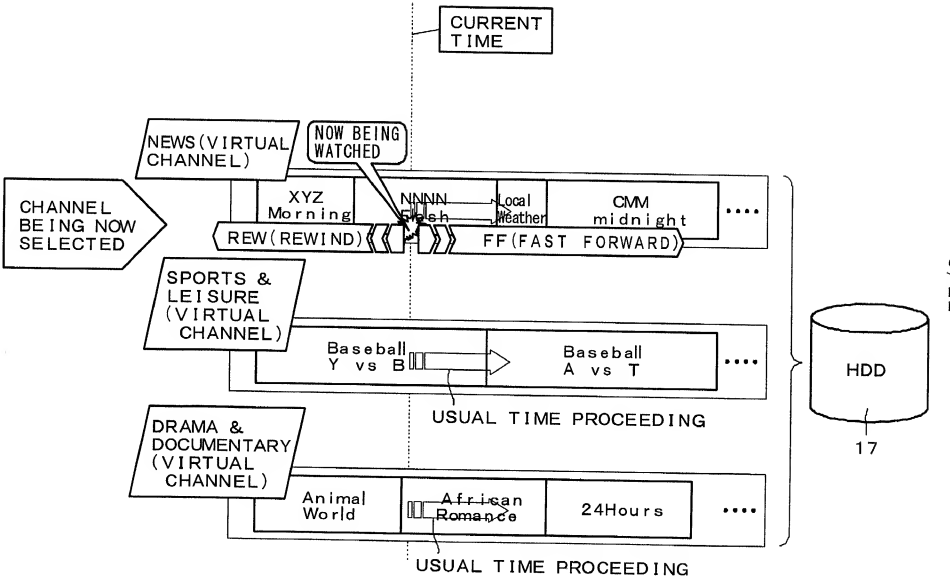
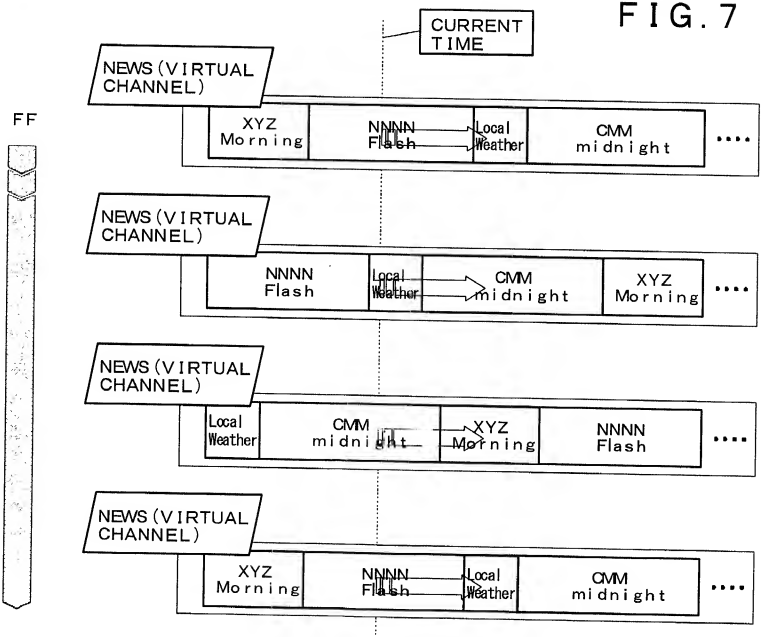

CURRENT TIME
TV JAPON (REAL CHANNEL)
ON AIR
Poke -man
Quiz $ & ?
Soccer P vs V
18:00
19:00
20:00
21:00
NEWS (VIRTUAL CHANNEL)
XYZ Morning
NNNN Flash
Local Weather
QMM midnight
CHANNEL NOW BEING SELECTED
NOW BEING WATCHED
SPORTS & LEISURE (VIRTUAL CHANNEL)
Baseball Y vs B
Baseball A vs T
DRAMA & DOCUMENTARY (VIRTUAL CHANNEL)
Animal World
African Romance
24Hours
HDD
17

FIG. 6


CURRENT TIME
NEWS(VIRTUAL CHANNEL)
NOW BEING WATCHED
CHANNEL BEING NOW SELECTED
XYZ Morning
NNNN Flash
Local Weather
CMM midnight
....
REW(REWIND)
FF(FAST FORWARD)
SPORTS & LEISURE (VIRTUAL CHANNEL)
Baseball Y vs B
Baseball A vs T
....
USUAL TIME PROCEEDING
DRAMA & DOCUMENTARY (VIRTUAL CHANNEL)
Animal World
African Romance
24Hours
....
USUAL TIME PROCEEDING
HDD
17

T02250 WO2009860

FIG. 7



T02250 hh0E9860

FIG. 8

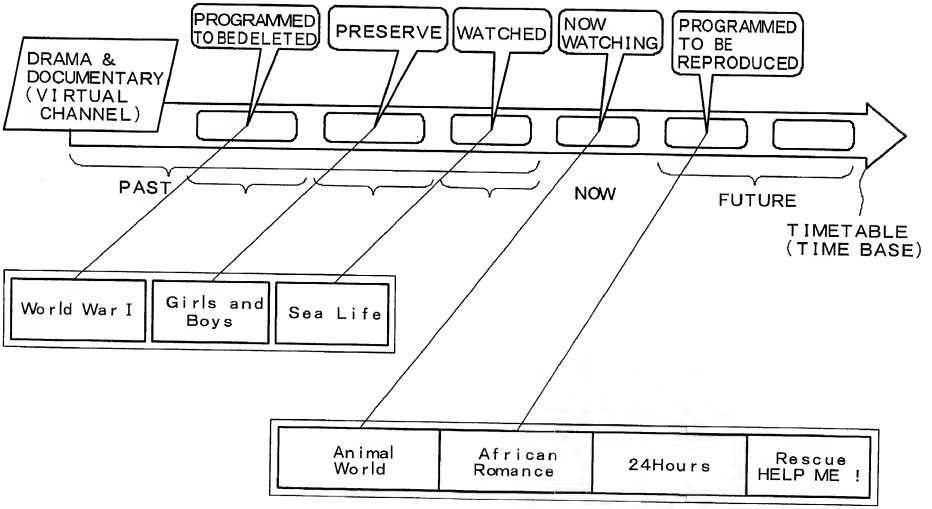


FIG. 9

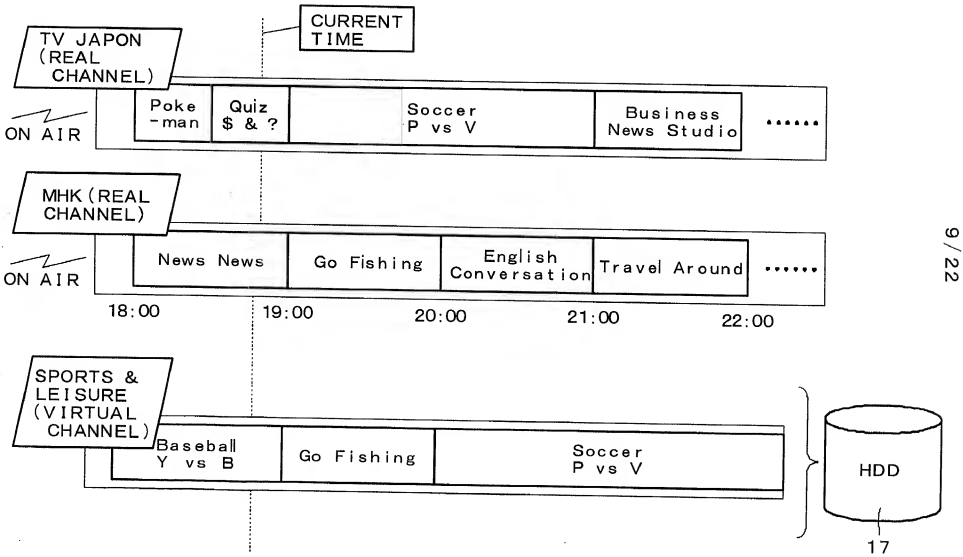

CURRENT TIME
TV JAPON (REAL CHANNEL)
ON AIR
Poke -man
Quiz $ & ?
Soccer P vs V
Business News Studio
.....
MHK (REAL CHANNEL)
ON AIR
News News
Go Fishing
English Conversation
Travel Around
.....
18:00
19:00
20:00
21:00
22:00
SPORTS & LEISURE (VIRTUAL CHANNEL)
Baseball Y vs B
Go Fishing
Soccer P vs V
HDD
17

FIG. 10

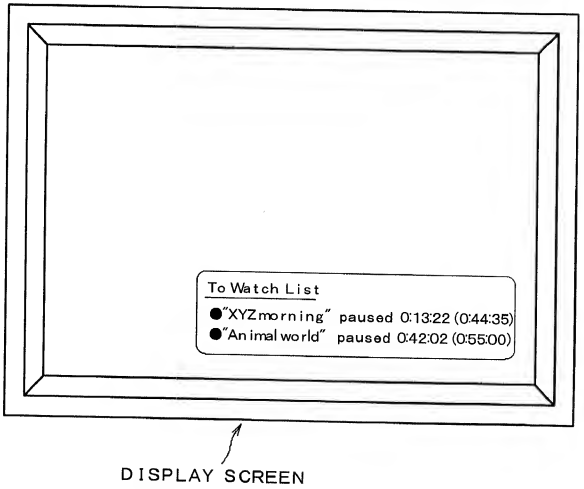

To Watch List
●"XYZmorning" paused 0:13:22 (0:44:35)
●"Animal world" paused 0:42:02 (0:55:00)
DISPLAY SCREEN

FIG. 11

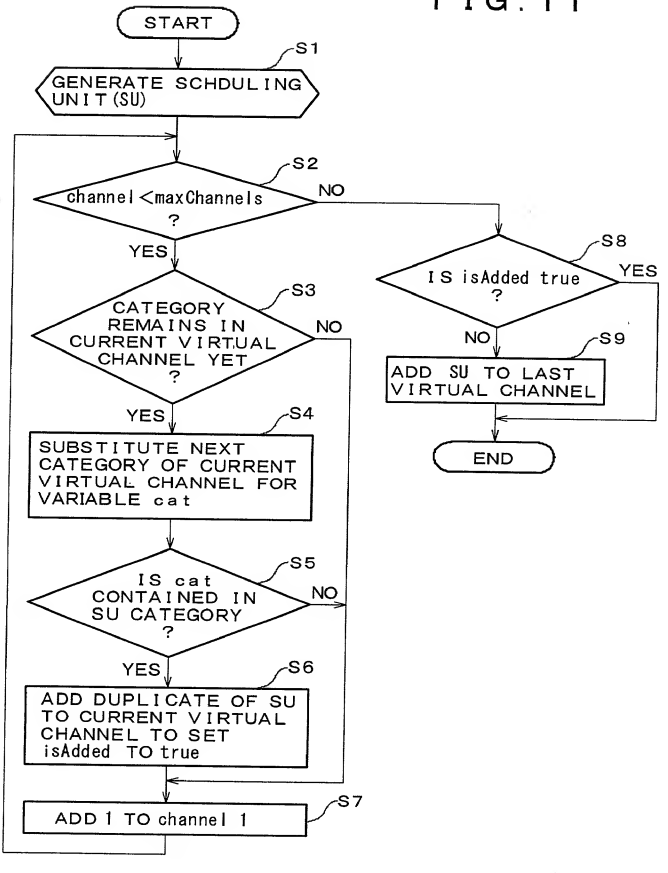


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FIG. 12

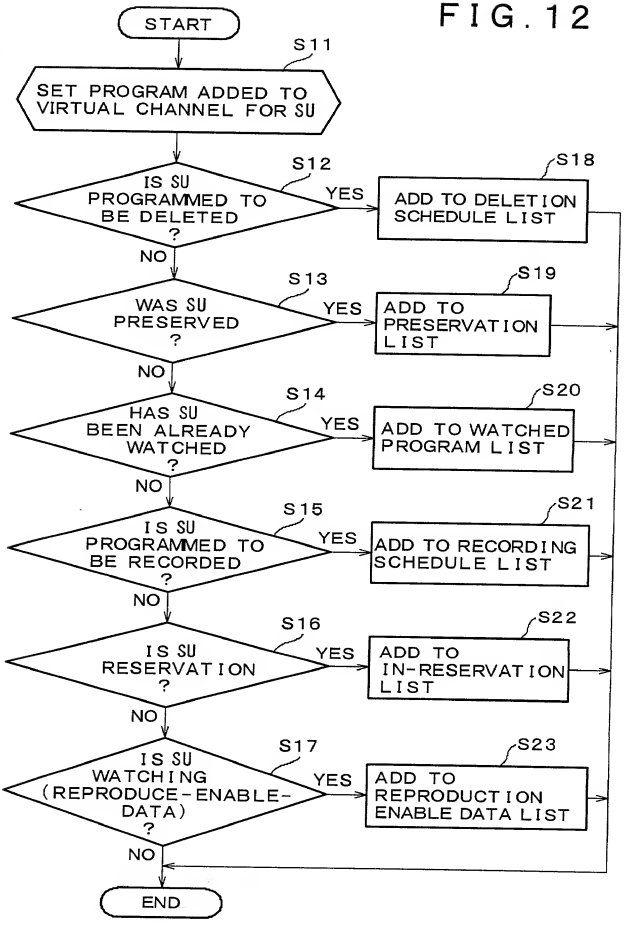
START
S11
SET PROGRAM ADDED TO VIRTUAL CHANNEL FOR SU
S12
IS SU PROGRAMMED TO BE DELETED ?
YES
S18
ADD TO DELETION SCHEDULE LIST
NO
S13
WAS SU PRESERVED ?
YES
S19
ADD TO PRESERVATION LIST
NO
S14
HAS SU BEEN ALREADY WATCHED ?
YES
S20
ADD TO WATCHED PROGRAM LIST
NO
S15
IS SU PROGRAMMED TO BE RECORDED ?
YES
S21
ADD TO RECORDING SCHEDULE LIST
NO
S16
IS SU RESERVATION ?
YES
S22
ADD TO IN-RESERVATION LIST
NO
S17
IS SU WATCHING (REPRODUCE-ENABLE-DATA) ?
YES
S23
ADD TO REPRODUCTION ENABLE DATA LIST
NO
END

FIG. 13

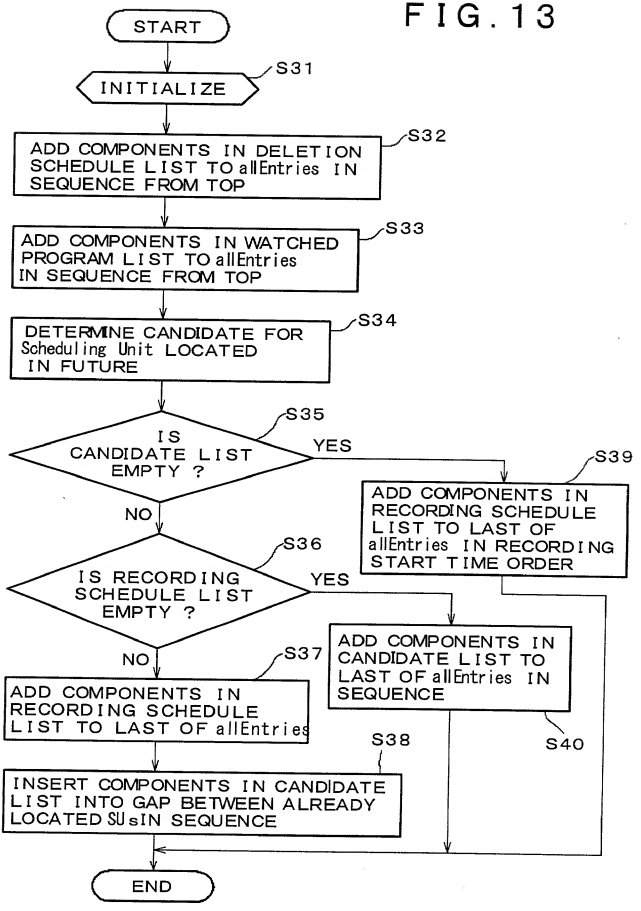
START
INITIALIZE
S31
ADD COMPONENTS IN DELETION SCHEDULE LIST TO allEntries IN SEQUENCE FROM TOP
S32
ADD COMPONENTS IN WATCHED PROGRAM LIST TO allEntries IN SEQUENCE FROM TOP
S33
DETERMINE CANDIDATE FOR Scheduling Unit LOCATED IN FUTURE
S34
IS CANDIDATE LIST EMPTY ?
S35
YES
NO
ADD COMPONENTS IN RECORDING SCHEDULE LIST TO LAST OF allEntries IN RECORDING START TIME ORDER
S39
IS RECORDING SCHEDULE LIST EMPTY ?
S36
YES
NO
ADD COMPONENTS IN RECORDING SCHEDULE LIST TO LAST OF allEntries
S37
ADD COMPONENTS IN CANDIDATE LIST TO LAST OF allEntries IN SEQUENCE
S40
INSERT COMPONENTS IN CANDIDATE LIST INTO GAP BETWEEN ALREADY LOCATED SUsIN SEQUENCE
S38
END

FIG. 14

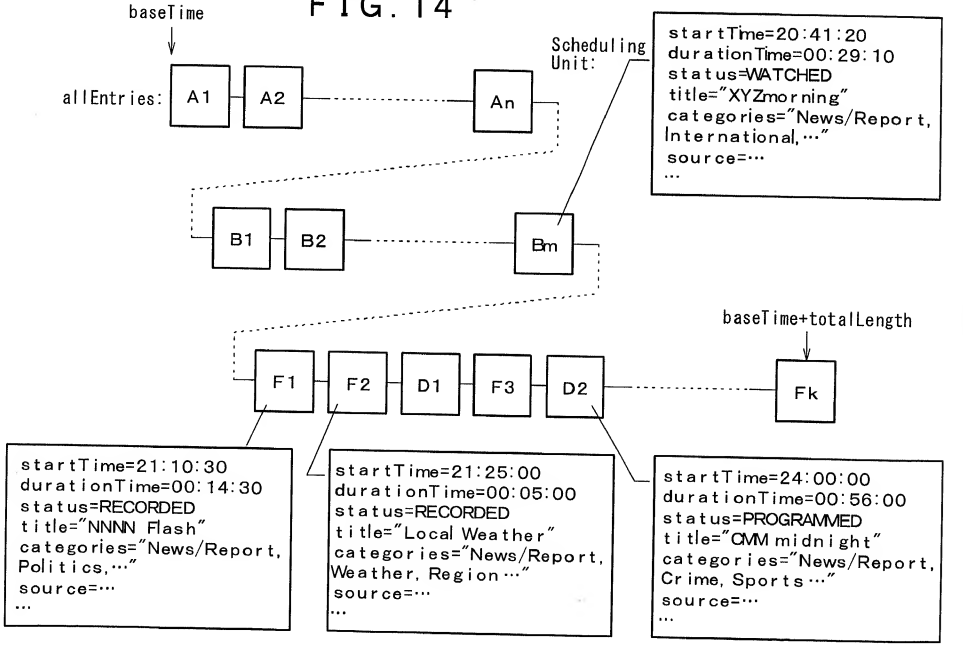
baseTime
allEntries:
A1
A2
An
Scheduling Unit:
startTime=20:41:20
durationTime=00:29:10
status=WATCHED
title="XYZmorning"
categories="News/Report, International,…"
source=…
…
B1
B2
Bm
baseTime+totalLength
F1
F2
D1
F3
D2
Fk
startTime=21:10:30
durationTime=00:14:30
status=RECORDED
title="NNNN Flash"
categories="News/Report, Politics,…"
source=…
…
startTime=21:25:00
durationTime=00:05:00
status=RECORDED
title="Local Weather"
categories="News/Report, Weather, Region…"
source=…
…
startTime=24:00:00
durationTime=00:56:00
status=PROGRAMMED
title="CMM midnight"
categories="News/Report, Crime, Sports…"
source=…
…

FIG. 15

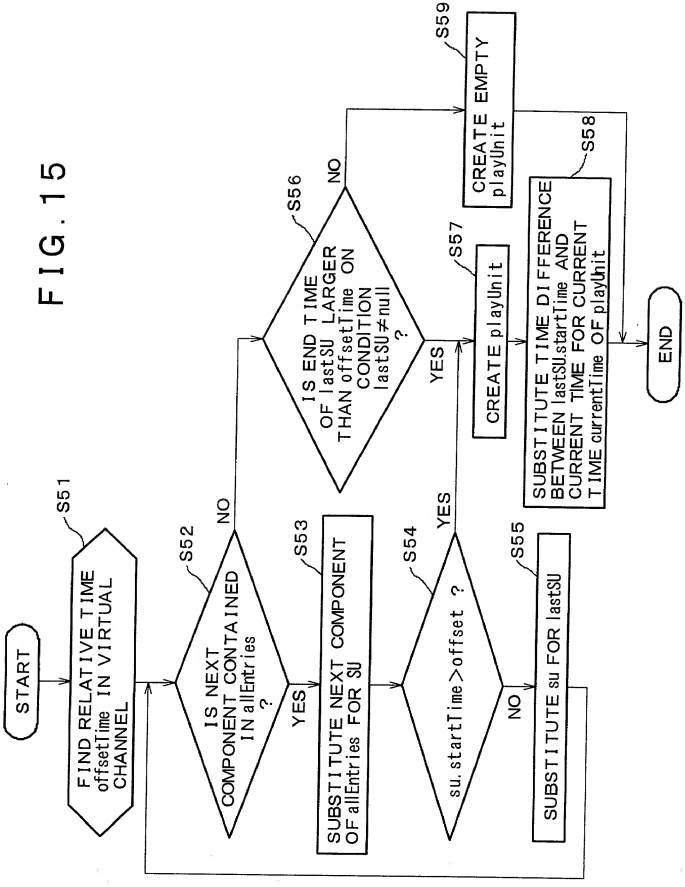
START
FIND RELATIVE TIME offsetTime IN VIRTUAL CHANNEL
S51
IS NEXT COMPONENT CONTAINED IN allEntries ?
S52
YES
NO
SUBSTITUTE NEXT COMPONENT OF allEntries FOR SU
S53
su.startTime>offset ?
S54
YES
NO
SUBSTITUTE su FOR lastSU
S55
IS END TIME OF lastSU LARGER THAN offsetTime ON CONDITION lastSU≠null ?
S56
YES
NO
CREATE playUnit
S57
SUBSTITUTE TIME DIFFERENCE BETWEEN lastSU.startTime AND CURRENT TIME FOR CURRENT TIME currentTime OF playUnit
S58
CREATE EMPTY playUnit
S59
END

FIG. 16

```
class Scheduling Unit {
        Time startTime;
        long durationTime;
        int status;
        String title;
        Set categories;
        TVContent source;
}
```

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FIG. 17

```
class PlayUnit {
        MediaLocator media;
        long startPosition;
        long durationTime;
        long currentPosition;

}
```

FIG. 18

```
class TVContent {
        long id;
        Time startTime;
        Time endTime;
        int channel;
        String Title;
        Set categories;
        String description;
        MedIaLocator media;
        long mediaOffset;
        Int status;
        Time reservedTime;

}
```

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FIG. 19

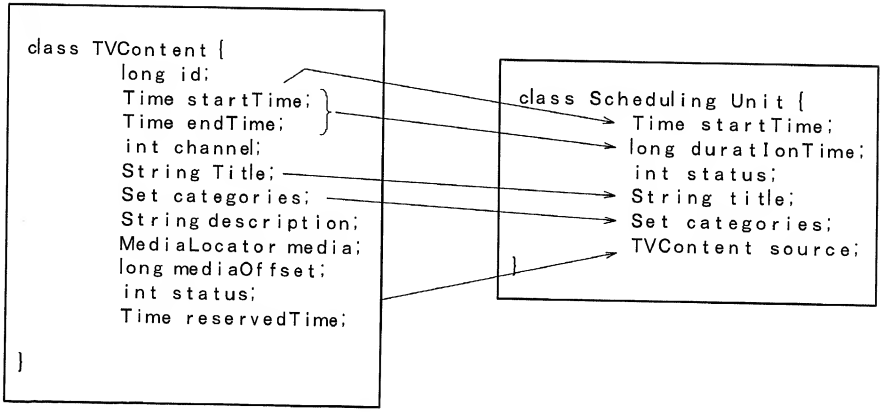

class TVContent {
long id;
Time startTime;
Time endTime;
int channel;
String Title;
Set categories;
String description;
MediaLocator media;
long mediaOffset;
int status;
Time reservedTime;
}
class Scheduling Unit {
Time startTime;
long duratIonTime;
int status;
String title;
Set categories;
TVContent source;
}

FIG.20

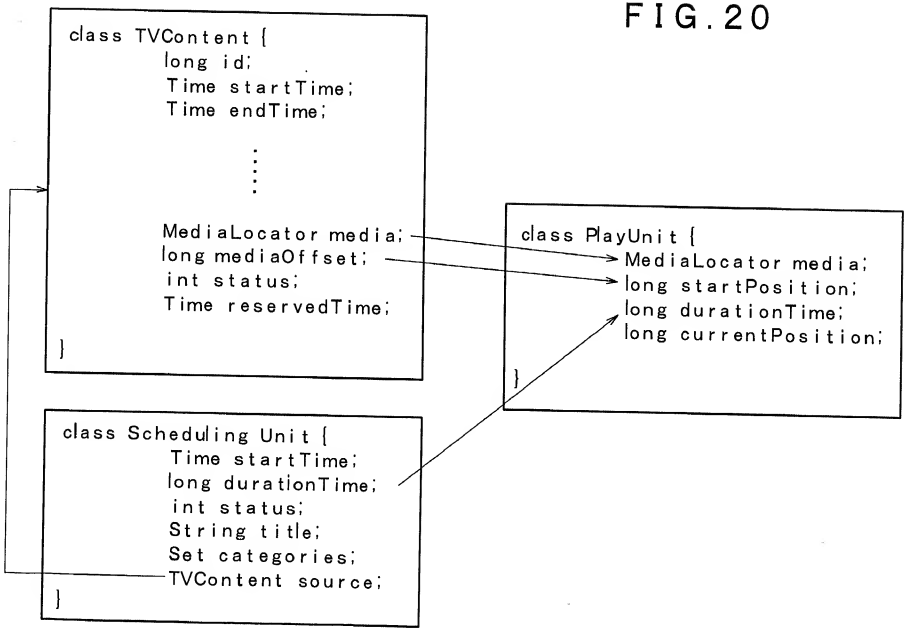
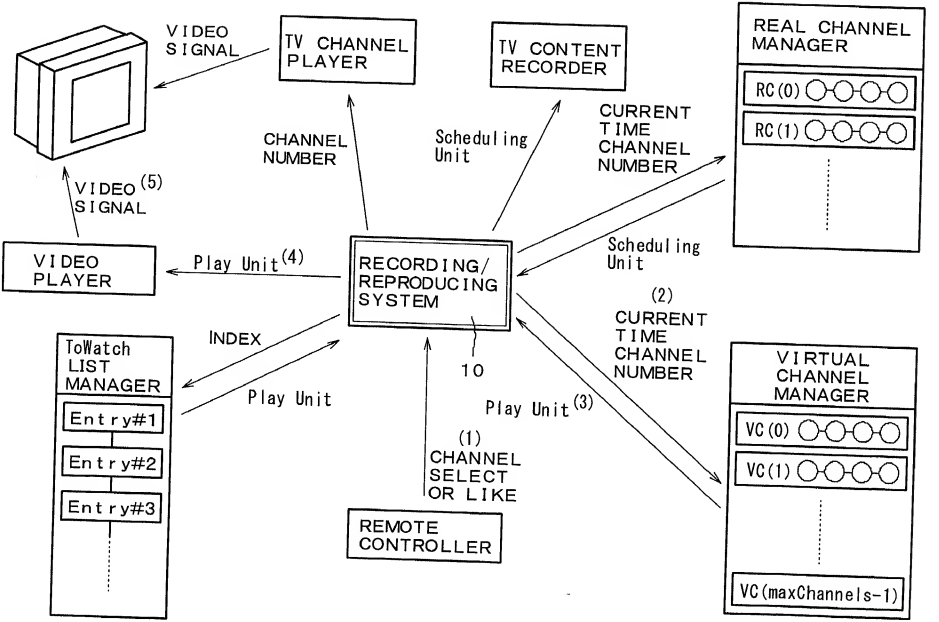

class TVContent {
long id;
Time startTime;
Time endTime;
MediaLocator media;
long mediaOffset;
int status;
Time reservedTime;
}
class PlayUnit {
MediaLocator media;
long startPosition;
long durationTime;
long currentPosition;
}
class Scheduling Unit {
Time startTime;
long durationTime;
int status;
String title;
Set categories;
TVContent source;
}

FIG. 21

```
class ToWatchListEntry {
        long currentPosition;
        String Title;
        long durationTime;
        int status;
        TVContent source;

}
```

FIG. 22


VIDEO SIGNAL
TV CHANNEL PLAYER
TV CONTENT RECORDER
REAL CHANNEL MANAGER
RC(0)
RC(1)
CHANNEL NUMBER
Scheduling Unit
CURRENT TIME CHANNEL NUMBER
VIDEO SIGNAL (5)
VIDEO PLAYER
Play Unit (4)
RECORDING/ REPRODUCING SYSTEM
Scheduling Unit
(2) CURRENT TIME CHANNEL NUMBER
INDEX
ToWatch LIST MANAGER
Entry#1
Entry#2
Entry#3
Play Unit
10
Play Unit (3)
VIRTUAL CHANNEL MANAGER
VC(0)
VC(1)
VC(maxChannels-1)
(1) CHANNEL SELECT OR LIKE
REMOTE CONTROLLER